

The Environmental Sciences: Synchrotrons Providing Powerful Tools for a New Science Workshop

May 20, 2002

A workshop on applications of synchrotron radiation in the environmental sciences has become a tradition at the NSLS Users' Meeting.

Two talks on soft X-ray applications were presented: Physicist Juergen Thieme, of the University of Georgia Augusta in Göttingen, Germany, outlined soft X-ray spectro-microscopy in studies of geochemical and environmental processes, and geoscientist Satish Myneni, of Princeton University, described the structure of water in controlling environmental processes. Two talks were given on powder diffraction. Jeffery Post, the Curator of the National Gem and Mineral Collection of the Smithsonian Institution in Washington, DC, demonstrated his joy in basic research by discussing real-time powder diffraction studies of the dehydration behaviors of clays. Geoscientist Peter Heaney, of Pennsylvania State University in University Park, showed how real time powder diffraction studies of hydrotalcites could elucidate the mechanism of rapid cation exchange in this class of clay minerals.

Chemist Hoi-Ying Holman, of Lawrence Berkeley National Laboratory, introduced the possibilities for synchrotron radiation FTIR spectro-microscopy to study microbial degradation of poly-aromatic hydrocarbon on mineral surfaces.

Environmental engineer Lisa Axe, of the New Jersey Institute of Technology in Newark, explained metal

sorption on amorphous iron and manganese oxides by X-ray Absorption Spectroscopy.

Chemist Martine Duff, of the Savannah River Technology Center in South Carolina, discussed applications of hard X-ray spectroscopy to the field of high-level radioactive waste treatment and characterization.

BNL geochemist Mark Fuhrmann outlined the applications of synchrotron techniques to phytoremediation.

The workshop concluded with a roundtable discussion on environmental science at NSLS: Chi Chang Kao, Associate Chair of NSLS, outlined the NSLS perspective and support for environmental research; Geoscientist Rich Reeder, of the State University of New York in Stony Brook, and environmental scientist Paul Kalb, of BNL, outlined the EnviroSuite initiative; BNL environmental scientist Keith Jones discussed the laboratory for Synchrotron-Based Earth and Environmental Research currently located at X26A and X27A; Steve Sutton, director of Consortium for Advanced Radiation Sources (CARS) - which goal is to develop X-ray beamlines at the Advanced Photon Source at Argonne National Laboratory - outlined the concept for EnviroSync to define needs of environmental science to synchrotron users.

-Douglas Hunter



Workshop Participants